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ABSTRACT

A study examined student responses to teacher-initiated questions in classrooms of English as a Second Language (ESL) and English as a Foreign Language (EFL). The study focused specifically on the similarities and differences in the questions asked by native-speaking (NS) teachers of ESL and by non-native-speaking (NNS) teachers of EFL, and to assess the relationship between teachers' question types and students' responses. Results suggest that: (1) the power of wh-questions is strong, triggering longer and more syntactically complex utterances than yes/no questions; (2) teachers should note that higher-level cognitive questions might increase the length and syntactic complexity of students speech; (3) NNS teachers may paraphrase questions in more cases, but not simply repeat them with one turn when students have difficulty answering; (4) in some contexts, teachers should give students frequent speaking turns and as much speaking time as possible; and (5) as in natural discourse outside the classroom, two-way or multi-way exchange of information is ideal for genuine communication. Further research on interactional features of teachers' questions, characteristics of followup questions, relationships between syntactic and cognitive question types, and the relationships between length and complexity of teacher questions and student responses is recommended. (MSE)

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Question-Answering Behaviors in ESL and EFL Classrooms: Similarities and Differences[1]

A Master's (M.A.T. in TESL) Research Paper
submitted to the Graduate School of Georgetown University
in partial fulfillment of the requirements for the
Thirty-nine Credit M.A.T. degree

by

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Washington, D.C.

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I. Introduction

Question-answering is predominant and pervasive in classrooms of most subjects, since it is the easiest way to establish oral interaction between teacher and student. In ESL (English as a Second Language) and EFL (English as a Foreign Language) classrooms as well, by asking students questions, teachers are able to elicit utterances from students and guarantee student talking time, because a question "compels, requires, may even demand, a response" (Goody 1978:23). This verbal exchange is expected to play an important role in classroom language acquisition of students in terms of input, interaction, and output, by which I mean input by teachers' and other students' questions, interaction between teacher and student through question-answering, and output by students through asking and answering questions.

Classroom discourse is often characterized as having three moves: initiation, response and feedback (Sinclair and Coulthard 1975). The following example from the data in this research illustrates the use of these terms:

Initiation --- T: Now, was George influenced by these great changes at the beginning of the twentieth century, Tsukada [student's name]?
Response ----- S: Yes, he was.
Feedback ----- T: Yes, he was greatly influenced by the changes. All right.
(T=Teacher, S=Student)

In this study, I will focus only on initiation (questioning) and response (answering). Feedback is not within the scope of this study.

Furthermore, question-answering is an example of the category "adjacency pair," a term which Schegloff and Sacks (1973:295-7) proposed. An adjacency pair consists of two sequential utterances which different speakers produce, the first pair part (question) being directly and often obligatorily followed by the second pair part (answer). Therefore, it is clear that teachers can provide the students with opportunities to hold the conversational floor by asking questions.

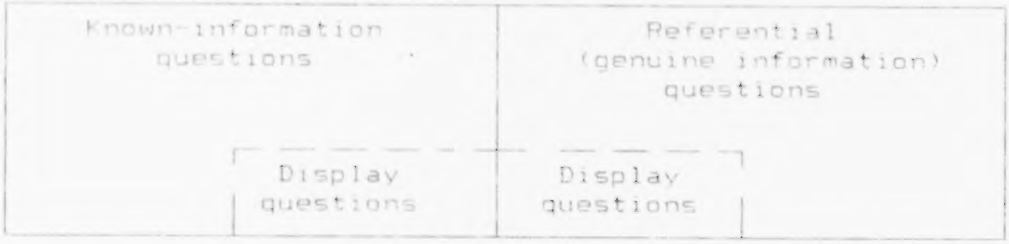
In classroom research, there have been few studies of teacher questioning patterns in ESL classroom settings. The seminal work was carried out by Long and Sato (1983) to investigate the forms and functions of questions posed by ESL teachers. They compared six ESL teachers' speech in classrooms with thirty-six NSs' speech in informal NS-NNS (native speaker/ non-native speaker) conversations outside classrooms. The study showed that ESL teachers used significantly more display questions (51% of a total of 938 questions) than referential questions (14%) in classrooms. (In Long and Sato's terms, display questions refer to questions whose answers the teacher knows, while referential questions are ones to which the teacher asks for information he or she doesn't know.) In contrast, in informal NS-NNS conversations outside classrooms, 76% of a total of 1,322 questions were referential questions and only 0.2% were display. The dichotomy of display/referential questions in Long and Sato's study, however, is problematic. van Lier (1988a, b) has criticized Long and Sato's labels in that the function of these

two questions may be the same, namely, elicitation of verbal responses, and that the difference between them may be minimal and trivial in interactional terms. In addition, although Long and Sato defined display questions only as known-information questions, referential (unknown-information or genuine) questions are sometimes used for display purposes, as the following example and figure show (Bailey 1989, personal communication):

T: When is your birthday?
S: It's January the fourteenth.

FIGURE 1

Relationship between Display and Referential Questions



In this example of a cross between known-information and referential questions, the student merely displays knowledge about his or her personal history when the teacher does not know the answer. It seems impossible to categorize this question as a display or referential one.

White and Lightbown (1984) analyzed 1,387 questions produced by three ESL teachers in a total of seven classes. They found that 64% of the total number of teacher questions were repetitions of previous questions, which did not increase student

responses, and that students rarely asked questions in class (a total of only 104 questions).

Brock (1986) examined the effects of display/referential questions asked by four ESL teachers on learners' responses (the total number of questions = 335). Learners' responses were more than twice as long and more than twice as syntactically complex in response to referential questions, as compared to display questions.

Pica and Long (1986) compared the speech of eight experienced ESL teachers with that of six inexperienced ESL teachers. Inexperienced teachers asked more Yes/No questions and fewer Wh-questions than experienced teachers. They also found that ESL teachers almost exclusively used display questions, compared to referential ones.

To my knowledge, to date, there has been no classroom research on the characteristics of questions which nonnative-speaking (NNS) teachers employ in EFL classrooms - a topic which should be studied more in the future, because of a relatively small number of EFL classroom research. In this research, I will compare the characteristics of question-answering behaviors in ESL classes with those in EFL classes, and deal exclusively with two ESL classes in America and two EFL classes in Japan, in order to limit the variables.

II. Purpose of the Study

The main purpose of this present study is to investigate the similarities and differences of questions asked by NS (native-speaking) teachers in ESL classrooms and NNS teachers in EFL classrooms. In terms of the distributions of NS/NNS teachers, it is likely that most ESL classes are taught by NS teachers, whereas NNS teachers conduct a majority of EFL classes, although, to my knowledge, no figures have been collected to support this. It would not be unreasonable to compare these two variables when the role of the teachers' first language regardless of ESL/EFL classroom settings is taken into account. A second objective of the study is to assess the relationship between teachers' question types and students' responses, which may well be similar in ESL and EFL contexts. The last is to examine the linguistic nature of ESL and EFL students' production in response to teachers' and students' questions.

The following three research questions are addressed:

1. How do NS teachers and NNS teachers differ in their questioning behaviors?
2. What types of teachers' questions elicit longer and more syntactically complex responses from students?
3. How do ESL students and EFL students differ in production with regard to the amount of student talk in responding to teachers' and students' questions and the number of questions that students employ?

III. Hypotheses

In attempting to answer the research questions above, the following fifteen hypotheses have arisen: the first nine hypotheses are concerned with research question No.1, the next four hypotheses with research question No.2, and the last two hypotheses with research question No.3.

Hypothesis 1:
There is no statistically significant difference in the frequencies of three syntactic question types (Yes/No questions, Or questions, and Wh-questions) used by NS and NNS teachers.

Here I pose the null hypothesis, because no theory or previous research has suggested a difference.

Hypothesis 2:
NS teachers use proportionately more tag questions and indirect questions than NNS teachers.

It is predicted that NS teachers have a wider variety of questioning strategies, such as uses of tag or indirect questions, than do NNS teachers, because of the NS teachers' greater language proficiency.

Hypothesis 3:
NS teachers ask longer questions than NNS teachers.

Hypothesis 4:
NS teachers ask more syntactically complex questions than NNS teachers.

Corder (1981:147) states that "...Teacher Talk is simpler than other registers of talk such as, for instance, that used between native speaking adults." NS teachers can simplify and modify teacher talk in conversation with their NNS students[6] (e.g., Gaies 1977, Ishiguro 1986). It is assumed that NNS teachers often

produce "interlanguage" (Selinker 1972), which is not as established or as acquired as a native language of NS teachers but rather still in the process of language development. The NNS teachers' language proficiency, therefore, may not be at the same level as the modified NS speech. NNS teachers may have difficulties producing longer and more syntactically complex questions. Thus, due to presumed differences in language proficiency, Hypotheses 3 and 4 are formulated.

Hypothesis 5:
NS teachers ask proportionately more higher cognitive questions (questions calling for interpretation, opinion, evaluation, and judgment) than NNS teachers do.

Hypothesis 6:
NNS teachers ask proportionately more lower cognitive questions (questions asking for recognition or recall of factual information) than NS teachers do.

It is predicted that NNS teachers tend to recognize the importance of set patterns, such as one often finds in pattern practice, and stick closer to the textbook so that the students may master the target sentences accurately and understand the contents of the textbook very well. Higher frequencies of lower cognitive questions in the NNS teachers' corpus are expected. On the other hand, NS teachers may enjoy meaningful or genuine communication easily, asking more higher cognitive questions, most of which are relevant to the text or beyond it.

Hypothesis 7:
Within one speaking turn, there are more substitutions of a Yes/No question for a Wh-question asked by a teacher than those of a Wh-question for a Yes/No question, whether the teacher is an NS or NNS.

That is, I will expect a Wh-question to precede a Yes/No

question, more frequently than vice versa. The following show the substitutions of a Yes/No question for a Wh-question (Example 1) and of a Wh-question for a Yes/No question (Example 2):

Example 1--from the EFL class data

T: What happened?
Did he lose interest in the ball game?

Example 2--from the ESL class data

T: Are you used to giving gifts to your boyfriend?
What kind of gift will you give your friend?

This hypothesis reveals the similarity between NS and NNS teachers' questioning behaviors. It is assumed that there is a tendency for a teacher to change a syntactic question type from a Wh- to a Yes/No question when he or she guesses that a Wh-question is more difficult for the students to answer, whether or not there is enough time for students' processing and answering, as long as the teacher talks about the same topic.

Hypothesis 8:
There are proportionately more repetitions in NNS teachers' questions than in those of NS teachers, within one turn.

Hypothesis 9:
There are proportionately more paraphrases in NS teachers' questions than in those of NNS teachers, within one turn.

The term 'repetition' is, in this study, defined as the phenomenon that a question is followed by the same syntactic question type with no paraphrases--either partial or full repeating of the previous question in succession. The following example, excerpted from the ESL data, illustrates this term:

T: Hiroko, what - what makes you happy?
What things make you happy?

In contrast, the term 'paraphrase' means that a question is changed either to the same syntactic or to a different syntactic question type containing different words or phrases in conveying the same or similar meanings, as the following example from the EFL data shows:

> T: What do you think he was doing?
> Was he sleeping on the grass or was he playing some kind of sport?

Since NNS teachers are often assumed to have lower language proficiency than NS teachers, it follows that NNS teachers will have some difficulties using a variety of expressions for saying the same or similar thing spontaneously; accordingly repetition may be an easier option available to NNS teachers. On the contrary, in asking questions, NS teachers may have such a wide range of functional use of language that they will tend to attempt to paraphrase their questions more frequently and easily than NNS teachers, owing to their complete command of English. In this respect, Hypotheses 8 and 9 above are generated.

Hypothesis 10:
Both ESL students and EFL students produce longer utterances in response to Wh-questions than to Yes/No questions.

Hypothesis 11:
Both ESL students and EFL students produce more syntactically complex utterances in response to Wh-questions than to Yes/No questions.[3]

In the case of Yes/No questions, even if a student utters a one-word answer such as "Yes/No," the communication will be successful. As Long (1981:149) points out, "the respondent needs only to confirm or deny" the proposition made by the questioner,

by saying "Yes/No" in response to Yes/No questions. It is hypothesized that Wh-questions may require longer and more syntactically complex sentences to get the message across, although a one-word response to a Wh-question can be made, such as the answer "Yesterday" in response to the question "When did you come back?"

Hypothesis 12:
Both ESL students and EFL students produce longer utterances in response to higher cognitive questions than to lower cognitive questions.

Hypothesis 13:
Both ESL students and EFL students produce more syntactically complex utterances in response to higher cognitive questions than to lower cognitive questions.

While a student is trying to answer a higher cognitive question, he or she has to elaborate the messages, since a higher cognitive question requires interpretation, opinion, evaluation, and judgment. In the process, the sentences tend to become longer, with greater syntactic complexity.

Hypothesis 14:
ESL students produce longer communication units (to be defined on page 17) per turn in answering teachers' and students' questions than do EFL students.

This difference may be due to cultural values. Previous research (McLean 1982) has found that Japanese students in ESL classrooms took fewer speaking turns than non-Japanese students. Following it, it is assumed that Japanese students in EFL classrooms do not take turns very often, nor do they talk for a long time in one turn. In most of the courses, they are not accustomed to taking an active role in interactions (Bannai 1981:153), since "few

academic courses or activities are designed to promote eloquence or skill in argument" (Barnlund 1989:115). Their attitude tends to be very passive: they just sit down and listen to the teacher. Asian Project (1974:51) reports that:

> His [The Asian student's] reluctance to ask questions in class, much less to speak out, may stem from his feelings of shyness or self-consciousness in the presence of his teacher. To leave himself open to making a mistake and "losing face" before his teacher is a frightening thought.

On the other hand, it is likely that ESL students notice or are taught the importance of active verbal participation: this classroom behavior is considered to be significant and desirable in American educational settings (see Barnlund 1989:112-3). Therefore it is hypothesized that ESL students produce longer turns than do EFL (Japanese) students.

Hypothesis 15:
ESL students ask more questions of teachers and classmates than do EFL students.

It is hypothesized that EFL students in Japan are not active participants in class and do not try to initiate the interaction by asking questions, because they are apt to hesitate taking turns on their own initiative and, instead wait for turn-allocation made by their teacher owing to Japanese cultural values; for instance, in most Japanese educational settings, students are likely to avoid interrupting the teacher who is talking or explaining, by asking questions, since such a behavior is not considered good manners. It should be noted that this may vary, depending on the EFL classroom settings.

IV. Method

Subjects

The subjects of this study consisted of two ESL classes taught by NS teachers and two EFL classes taught by NNS teachers. These classes were chosen by random sampling. The NS teachers were American (one male and one female), while the NNS teachers were Japanese (two males).[4] They were all experienced teachers, each with more than 20 years in the field of TESOL.

Each teacher taught his or her regular class. The NS teachers taught ESL classes to international students (ages ranging from 18 through late 20's) from various countries, including Europe, Latin America, Asia,[5] and so on, at the Division of English as a Foreign Language at Georgetown University in spring and summer semesters, 1989. The ESL classes had 12 students, on average, from a variety of ethnic and native language backgrounds, who enrolled in the advanced or intermediate courses of the program. In contrast, each of NNS teachers in 1984 or in 1987 conducted EFL demonstration classes to Japanese senior high school students (the first year--15 or 16 years old and the third year--17 or 18 years old), most of whom had been studying English only in foreign language classroom settings. These EFL classes were conducted in the annual conventions of the Institute for Research in Language Teaching, Tokyo, Japan, which Harold E. Palmer founded in 1923. The level of instruction in the EFL classes was intermediate. The EFL class size was 40 students on average. The length of the four classes

was held constant - 50 minutes.

All four teachers used the textbooks or materials which were the bases of classroom activities, and conducted typical lessons that seemed to emphasize an eclectic approach to language teaching, including a variety of activities such as comprehension of the text, oral practices, explanations of target points, reading practices, and textbook exercises.

Regarding class formats, four classes were filled with teacher-centered activities, with the exception of such student-centered activities as eleven-minute class discussions led by one student at the end of one ESL class and seven-minute speech activities at the beginning of one EFL class; in both classes there were question-and-answer exchanges between students. Thus, the ESL and EFL classes may have had the similar kinds of classroom structures, in terms of the distributions of teacher- and student-centered activities.

Data collection

I observed and audiotaped the ESL classes taught by the NS teachers. The students were not aware of the recording; the tape recorder was unobtrusive to them. The EFL classes by the NNS teachers, which I observed, were videotaped by the technicians.[6]

I transcribed the tapes later only by listening to the audiotapes: I converted the EFL class data from the videotapes to the audio channels. Therefore I was not influenced by the video channels in the transcriptions of the EFL classes.

Measures

I first measured the frequencies of question types in terms of syntax: (1) Yes/No questions (general questions), (2) Or questions (alternative questions), and (3) Wh-questions (special questions). This syntactic category of questions was proposed by Harold E. Palmer (1921:66). Furthermore, tag questions (e.g., You are tired, aren't you?) and indirect questions (e.g., I just wonder what you did yesterday.) were added to this category for the purpose of this study. In this study, questions include initial questions, repeated questions, and paraphrased questions and do not include statements and imperatives that may elicit verbal responses from students.

Next, the analysis was done by calculating the frequencies of two types of cognitive questions, that is, higher cognitive questions and lower cognitive questions. This category of two cognitive question types was described by Winne (1979:14):

> ...higher cognitive or divergent questions ask the student to mentally manipulate bits of information previously learned to create an answer, or support an answer with logically reasoned evidence. Lower cognitive or convergent questions...call for the student merely to recall verbatim or in his own words material previously read or taught by a teacher.

I will therefore define higher cognitive questions as those calling for interpretation, opinion, evaluation and judgment, and lower cognitive questions as those asking for recognition or recall of factual information, as indicated on page 8. This category is different from display and referential questions as

the terms are used by Long and Sato (1983). Lower cognitive questions are likely to be known-information questions, because most lower cognitive questions simply enable the students to recall and display their knowledge, which a teacher knows. Some lower cognitive questions, however, could contain referential values of questions: in this case a teacher does not know the answers to lower cognitive questions.

The majority of higher cognitive questions tend to be referential (Bailey, personal communication), because there is a general tendency that a teacher does not know what kinds of answers the students try to create in response to most higher cognitive questions. But in some cases where a teacher knows the answers to the questions which may require high cognitive processing for the students, higher cognitive questions could be known-information questions. The preceding discussion suggests the following figure:

FIGURE 2

Relationship between Higher/Lower Cognitive Questions and Known-information/Referential Questions

Lower Cognitive Questions	Higher Cognitive Questions
Known-information questions	Referential questions
Referential questions	Known-information questions

The quantity of speech is measured by the number of words per communication unit (c-unit) or by the number of words per turn or by the number of c-units per turn. The quality of speech is measured by syntactic complexity, which is determined in terms of the number of Sentence nodes (S-nodes) per c-unit. Loban (1963:6-7) defines c-units as:

> grammatical independent predication[s] or...answers to questions which lack only the repetition of the question elements to satisfy the criterion of independent predication...."Yes" can be admitted as a whole unit of communication when it is an answer to a question such as "Have you ever been sick?"

For the purpose of this study, even if the interlanguage, which NNS teachers and ESL/EFL students produce, may include ungrammatical utterances, they will not be disqualified as c-units. Therefore, I follow Rulon and McCreary's (1986:186) definition, which is "based not on syntax or phonology but rather on meaning":

> a c-unit is defined as a word, phrase, or sentence which communicates pragmatic or semantic meaning regardless of grammaticality.

With regard to S-nodes, Brock (1986:53) provides the following exnlanation:

> Infinitives and gerunds, then, as well as tensed verbs, were taken to signal an underlying s-node. Modals were not considered to be signals of underlying s-nodes.

In this study, however, for instance, an answer containing a modal, such as "Yes, he <u>can</u>," is counted as one S-node. I will operationally define an S-node as "the branching point in a tree diagram where a sentence includes tensed lexical/auxiliary verbs

and tenseless verbs."

In this research, two statistical analyses of the data were made, including the chi-square test and z test. The significance level was set at $\alpha<.05$.

V. Results

The results of the calculations are shown in Tables 1-13. I will report the results of hypothesis-testing.

Hypothesis 1:
There is no statistically significant difference in the frequencies of three syntactic question types used by NS and NNS teachers.

The NS (American) teachers asked a total of 248 questions except tag and indirect questions, 127 of which were Yes/No questions (51.2%), only 5 of which were Or questions (2.0%), and 116 of which were Wh-questions (46.8%). On the other hand, the NNS (Japanese) teachers asked a total of 202 questions, 85 of which were Yes/No questions (42.0%), only 6 of which were Or questions (3.0%), and 111 of which were Wh-questions (55.0%). (See Table 1.) As predicted, there was no statistically significant difference in the frequencies of these three syntactic question types (χ^2=3.21, df=2, p>.05 (ns); $\chi^2_{critical}$=5.9915).

TABLE 1

Frequency of Three Syntactic Question Types

	Yes/No questions	Or questions	Wh- questions	Total
NS teachers (n=2)	127 51.2%	5 2.0%	116 46.8%	248
NNS teachers (n=2)	85 42.0%	6 3.0%	111 55.0%	202

(using Yates's correction factor) χ^2=3.21, df=2, p>.05 (ns)

Hypothesis 2:
NS teachers use proportionately more tag questions and indirect questions than NNS teachers.

As Table 2 shows, the NS teachers did not ask any tag questions but asked one indirect question, whereas the NNS teachers asked one tag question and five indirect questions. Since the total number of five syntactic question types asked by the NS teachers was 1.2 times (249 vs. 208 questions) as compared to that asked by the NNS teachers, the raw frequency in the NNS teachers' corpus was weighted by a factor of 1.2. With this weighting established, the NNS teachers asked 1.2 tag and 6 indirect questions. There was no statistically significant difference in the uses of tag and indirect questions at all, using the Yates's correction factor (χ^2=1.14, df=1, p>.05 (ns); $\chi^2_{critical}$=3.8415). This hypothesis was not supported.

TABLE 2

Frequency of Tag and Indirect Questions

	Tag questions	Indirect questions
NS teachers (n=2)	0	1
NNS teachers (n=2)	1	5

(using Yates's correction factor) χ^2=1.22, df=1, p>.05 (ns)

Hypothesis 3:
NS teachers ask longer questions than NNS teachers.

The mean length of NS teachers' total questions was 6.29 words; the mean length of NNS teacher's total questions was 5.89 words.

The NS teachers asked questions which were about 1.07 times as long as those of the NNS teachers. A statistically significant difference between the two groups was not obtained, as shown in Table 3 ($z=1.12$, $df=455$, $p>.05$ (ns); $z_{critical}=1.645$).

TABLE 3

Mean Number of Words per C-unit

	Yes/No questions	Or questions	Wh- questions	Tag questions	Indirect questions	Total*
NS teachers (n=2)	6.27	19.13	5.87	0.00	11.00	6.29 (s 4.21)
NNS teachers (n=2)	6.23	9.20	5.40	16.00	10.20	5.89 (s 3.40)

*$z=1.12$, $df=455$, $p>.05$ (ns), one-tailed

Hypothesis 4:
NS teachers ask more syntactically complex questions than NNS teachers.

The mean number of S-nodes per c-unit in the NS teachers' questions was 1.13. In comparison, the mean number of S-nodes per c-unit in the NNS teachers' speech was 1.14 (see Table 4). Therefore the NS teachers' speech is approximately as syntactically complex as the NNS teachers' speech. Contrary to my expectations, the data disproved this hypothesis ($z=0.13$, $df=455$, $p>.05$ (ns); $z_{critical}=1.645$).

TABLE 4

Mean Number of S-nodes per C-unit

	Yes/No questions	Or questions	Wh- questions	Tag questions	Indirect questions	Total*
NS teachers (n=2)	1.21	3.75	0.96	0.00	2.00	1.13 (s 0.96)
NNS teachers (n=2)	1.25	1.40	1.07	2.00	2.00	1.14 (s 0.69)

*z=0.13, df=455, p>.05 (ns), one-tailed

Hypothesis 5:
NS teachers ask proportionately more higher cognitive questions than the NNS teachers do.

Table 5 shows that in the corpus of the NS teachers' speech, of a total of 249 questions, 160 questions (64.3%) were higher cognitive questions, while the NNS teachers asked 79 higher cognitive questions (38.0%) out of 208 questions. The raw frequency of higher cognitive questions in the NNS teachers' corpus was weighted by a factor of 1.2, again, for the unequal total number of questions, whereby the NNS teachers posed 94.8 higher cognitive questions. This difference was statistically significant (χ^2=16.68, df=1, p<.001).

TABLE 5

Frequency of Cognitive Question Types

	Higher cognitive questions	Lower cognitive questions	Total
NS teachers (n=2)	160 64.3%	89 35.7%	249
NNS teachers (n=2)	79 38.0%	129 62.0%	208

χ^2=31.37, df=1, p<.001

Hypothesis 6:

NNS teachers ask proportionately more lower cognitive questions than NS teachers do.

As Table 5 shows, the NNS teachers asked 129 lower cognitive questions (62.0%), while the NS teachers asked 89 lower cognitive questions (35.7%), in the same time span. With the weighting by a factor of 1.2, the adjusted frequency of 154.8 lower cognitive questions posed by the NNS teachers was compared with 89 lower cognitive questions asked by the NS teachers. The hypothesis was sustained, providing a statistically significant difference between the two groups (χ^2=17.76, df=1, p<.001).

Hypothesis 7:

Within one speaking turn, there are more substitutions of a Yes/No question for a Wh-question asked by a teacher than those of a Wh-question for a Yes/No question, whether the teacher is an NS or NNS.

As indicated in Table 6, the NS teachers made 16 substitutions of Yes/No questions for Wh-questions and only 8 substitutions of Wh-questions for Yes/No questions out of 62 substitutions, A statistically significant difference between them was not obtained in the NS teachers' corpus (χ^2=2.66, df=1, p>.05 (ns); $\chi^2_{critical}$=3.8415). The NNS teachers had 12 substitutions of Yes/No questions for Wh-questions and only 4 substitutions of Wh-questions for Yes/No questions out of 56 substitutions. This difference was statistically significant in the NNS teachers' corpus (χ^2=4.00, df=1, p<.05). Therefore, Hypothesis 7 was not supported.

TABLE 6

Number of Substitutions of Syntactic Question Types within One Turn

	G→G	G→A	G→S	A→G	A→A	A→S	S→G	S→A	S→S	Total
NS teachers* (n=2)	16	1	8	0	0	1	16	3	17	62
	25.8%	1.6%	12.9%	0%	0%	1.6%	25.8%	4.8%	27.4%	
NNS teachers** (n=2)	15	1	4	0	0	1	12	3	20	56
	26.8%	1.8%	7.1%	0%	0%	1.8%	21.4%	5.4%	35.7%	

*χ^2 = 65.13, df=8, p<.001
**χ^2 = 59.56, df=8, p<.001
(G=General (Yes/No) questions, A=Alternative (Or) questions, S=Special (Wh-) questions)

Hypothesis 8:
There are proportionately more repetitions in NNS teachers' questions than in those of NS teachers, within one turn.

Table 7 shows that the NNS teachers had 29 repetitions of a total of 56 substitutions within one turn, while the NS teachers had 15 repetitions of a total of 62 substitutions within one turn. Owing to the unequal total number of question substitutions within one turn (62 vs. 56 substitutions), the weighting was established by a factor of 1.11. The NNS teachers used 32.19 repetitions. The result was supportive of the hypothesis (χ^2=6.26, df=1, p<.025).

TABLE 7

Frequency of Repetitions and Paraphrases of Teachers' Questions within One Turn

	Repetitions	Paraphrases
NS teachers (n=2)	15	44
NNS teachers (n=2)	29	22

χ^2=11.27, df=1, p<.001

Hypothesis 9:

There are proportionately more paraphrases in NS teachers' questions than in those of NNS teachers, within one turn.

As shown by the data in Table 7, there were 44 paraphrases out of 62 substitutions in the NS teachers' corpus; there were 22 paraphrases out of 56 substitutions in the NNS teachers' corpus. Again, the raw number of paraphrases made by the NNS teachers was weighted by a factor of 1.11 and the adjusted number of paraphrases was 24.42 in the NNS teachers' corpus. The difference was statistically significant (χ^2=5.60, df=1, p<.025).

Hypothesis 10:

Both ESL students and EFL students produce longer utterances in response to Wh-questions than to Yes/No questions.

In the ESL students' corpus, there was a statistically significant difference (z=2.91, df=219, p<.005) between the mean numbers of words per turn to Yes/No questions and words per turn to Wh-questions (6.15 words vs. 8.16 words, respectively).

In the EFL (Japanese) students' corpus, the students produced utterances which were about twice (1.76 times) as long in response to Wh-questions as compared to Yes/No questions (3.74 words vs. 2.13 words, respectively). A statistically significant difference was obtained (z=3.50, df=126, p<.0005). These findings in both the ESL and EFL students' corpora were supportive of Hypothesis 10 (see Table 8).

TABLE 8

Mean Number of Words per Turn by Students
in Response to Syntactic Question Types

	to Yes/No questions	to Wh-questions
ESL students* (n=23)	6.15 (s 4.57)	8.16 (s 5.52)
EFL students** (n=79)	2.13 (s 1.89)	3.74 (s 3.27)

*z=2.91, df=219, p<.005, one-tailed
**z=3.50, df=126, p<.0005, one-tailed

Hypothesis 11:
Both ESL students and EFL students produce more syntactically complex utterances in response to Wh-questions than to Yes/No questions.

Table 9 shows that in the ESL students' corpus, the mean number of S-nodes per c-unit in response to Wh-questions was 1.15, while the mean number to Yes/No questions was 0.88. This difference reveals a statistically significant difference in the mean length of utterances (z=1.93, df=322, p<.05). The ESL students produced significantly more syntactically complex utterances in response to Wh-questions than to Yes/No questions.

In the EFL students' corpus, their responses to Wh-questions contained 0.69 S-nodes per c-unit, on average; responses to Yes/No questions included 0.38 S-nodes per c-unit, on average. This indicates that Wh-questions triggered sentences that were approximately twice (1.82 times) as syntactically complex as Yes/No questions. This difference was statistically significant (z=2.82, df=130, p<.005). The findings from the ESL and EFL students' corpora thus supported Hypothesis 11.

TABLE 9

Mean Number of S-nodes per C-unit
in Response to Syntactic Question Types

	to Yes/No questions	to Wh-questions
ESL students* (n=23)	0.88 (s 1.32)	1.15 (s 1.14)
EFL students** (n=79)	0.38 (s 0.30)	0.69 (s 0.83)

*z=1.93, df=322, p<.05, one-tailed
**z=2.82, df=130, p<.005, one-tailed

Hypothesis 12:
Both ESL students and EFL students produce longer utterances in response to higher cognitive questions than to lower cognitive questions.

The ESL students produced 8.36 words per turn on average when they responded to higher cognitive questions; only a mean of 4.85 words per turn were uttered in response to lower cognitive questions. Therefore this shows that ESL students' utterances in response to higher cognitive questions were 1.72 times as long as those in response to lower cognitive questions. As seen in Table 10, there was statistical significance in the ESL students' corpus (z=5.40, df=225, p<.0005).

In the EFL students' corpus, however, there was no statistically significant difference (z=0.26, df=133, p>.05 (ns); $z_{critical}$=1.645): the mean length of words per turn in response to higher cognitive questions was 2.98 words and the mean length of words per turn to lower cognitive questions was 2.84. Therefore, Hypothesis 12 was rejected.

TABLE 10

Mean Number of Words per Turn by Students
in Response to Cognitive Question Types

	to Higher cognitive questions	to Lower cognitive questions
ESL students* (n=23)	8.36 (s 5.66)	4.85 (s 4.04)
EFL students** (n=79)	2.98 (s 3.39)	2.84 (s 2.32)

*z=5.40, df=225, p<.0005, one-tailed
**z=0.26, df=133, p>.05 (ns), one-tailed

Hypothesis 13:
Both ESL students and EFL students produce more syntactically complex utterances in response to higher cognitive questions than to lower cognitive questions.

As shown in Table 11, this hypothesis found no support in the data. Although there was a statistically significant difference ($z=1.85$, $df=327$, $p<.05$) in the mean number of S-nodes per c-unit between in response to higher cognitive questions and in response to lower cognitive questions in the ESL class corpus (1.03 vs. 0.79 S-nodes per c-unit), the results in the EFL class corpus were not statistically significant ($z=0.17$, $df=137$, $p>.05$ (ns); $z_{critical}=1.645$): in the EFL class corpus, the mean number of S-nodes per c-unit was 0.55 in response to higher cognitive questions and 0.53 in response to lower cognitive questions.

TABLE 11

Mean Number of S-nodes per C-unit
in Response to Cognitive Question Types

	to Higher cognitive questions	to Lower cognitive questions
ESL students*	1.03	0.79
(n=23)	(s 1.23)	(s 1.21)
EFL students**	0.55	0.53
(n=79)	(s 0.61)	(s 0.84)

*z=1.85, df=327, p<.05, one-tailed
**z=0.17, df=137, p>.05 (ns), one-tailed

Hypothesis 14:
ESL students produce longer c-units per turn in answering teachers' and students' questions than do EFL students.

Table 12 shows that the students produced multiple c-units per turn, for example, ranging from 1 c-unit per turn to 6 c-units per turn in the ESL corpus, when they responded to questions asked by teachers and other students. There were 164 occurrences of 1 c-unit per turn and 50 occurrences of 2 c-units per turn in the ESL corpus, while the EFL corpus included 120 occurrences of 1 c-unit per turn and only 2 occurrences of 2 c-units per turn. This means that the great majority of EFL students' answers consisted of 1 c-unit utterances (97.6%), in which they tended to talk for a very short time per turn. Totally, the ESL corpus had 77 occurrences of more than 1 c-unit per turn, whereas the EFL corpus had only 3 occurrences of more than 1 c-unit per turn. The difference between the two corpora was statistically significant (χ^2=35.97, df=5, p<.001).

TABLE 12

Occurrences of C-units per Turn in Students' Answers

	1 c-unit	2 c-units	3 c-units	4 c-units	5 c-unite	6 c-units
ESL students (n=23)	164	50	21	3	1	2
EFL students (n=79)	120	2	1	0	0	0

(using Yates's correction factor) $\chi^2=35.97$, df=5, $p<.001$

Hypothesis 15:
ESL students ask more questions of teachers and classmates than do EFL students.

A greater total number of questions were produced by the ESL students than by the EFL students: the total number of questions posed by the ESL students was 32, while the EFL students employed a total of 11 questions. This difference between the two groups was statistically significant ($\chi^2=10.26$, df=1, $p<.005$), thereby providing support for Hypothesis 15 (see Table 13).

TABLE 13

Number of Students' Questions

	Addressed to Students	Addressed to Teachers	Total
ESL students (n=23)	13 40.6%	19 59.4%	32
EFL students (n=79)	10 91.0%	1 9.0%	11

(using Yates's correction factor) $\chi^2=6.42$, df=1, $p<.025$

VI. Discussion

In terms of research question No.1, out of nine hypotheses regarding teachers' questioning behaviors, the results supported five hypotheses.

The first important finding is concerned with the linguistic characteristics of teacher talk. I found that the NS teachers produced approximately as long and syntactically complex questions as the NNS teachers, contrary to Hypotheses 3 and 4. There are two possibilities to be taken into account with regard to this result: (1) the NS teachers, who had higher proficiency than the NNS teachers, might have adjusted their speech to the appropriate level which would be comprehensible to their students, and (2) the NS and NNS teachers may have had about the same proficiency. I cannot conclude the validity of either claim, however, because determining the differences of the teachers' proficiency levels, and the comparisons between teacher talk in class and normal talk outside classrooms are beyond the scope of this research.

The second important result concerns the use of higher and lower cognitive questions (Hypotheses 5 and 6). The NS teachers asked proportionately more higher cognitive questions and fewer lower cognitive questions than did the NNS teachers. This indicates that the NS teachers may have been trying to establish meaningful interaction with their students where the negotiation of meaning can take place, recognizing that their students' English proficiency would suit higher cognitive questions. It may

be that students' proficiency affect the teachers' choices of higher or lower cognitive questions.

The third important issue is the frequencies of repetitions and paraphrases within one turn (Hypotheses 8 and 9). It was found that the NNS teachers used more repetitions, while the NS teachers used more paraphrases. This result may support the idea that by providing a variety of expressions for saying the same thing, which seemed to be less constrained behaviors to the NS teachers than to the NNS teachers in this study, the input will be comprehensible to the learners; that is, the students' comprehension will be developed, as a result of which the students may answer very well. I am not saying that repetition is of little value. Gaies (1977:209) mentioned that "repetition is an alternative or complement to linguistic simplification as a means of facilitating comprehension." Repetition can play an important role in students' comprehension, because "repetition of a sentence would give added processing time, thus increasing the child's chances of successfully processing the sentence" (Snow 1972:563). Thus, as Johnstone (1984:256) points out:

> Paraphrase and other kinds of repetition seem to be crucial mechanisms in language learning, because they provide data about possible choices, or, to use a familiar term for the structure of choices in language, about the paradigmatic axis.

I cannot, however, conclude which is more effective, repetition or paraphrase, for enhancing not only the students' comprehension but also their production, but it is evident from Hypotheses 8 and 9 that there was a statistically significant tendency that

the number of paraphrase made by the NNS teachers was very small.

Extremely low frequencies of tag and indirect questions were found in both the NS and NNS teachers' corpora (Hypothesis 2). Tag questions accounted for 0% of a total of questions in the NS teachers' corpus and 0.5% in the NNS teachers' corpus. The percentage of indirect questions was 0.4% in the NS teachers' corpus and 2.4% in the NNS teachers' corpus. Previous study, however, shows that in NS-NS conversations outside classrooms the percentage of tag questions out of the total questions was 7.13% and in NS-NNS conversations outside classrooms it was 4.95% (Long 1983:130). (The indirect question type was not calculated in Long's research.) It may be rather difficult for the students to respond to tag and indirect questions appropriately. - For one thing, syntactically, most of these two question types start with the subjects, rather than with the auxiliary verbs like most Yes/No and Or questions, or with Wh-question words like Wh-questions; Additionally, tag questions do not necessarily have to be answered (Brown 1981, cited in Celce-Murcia and Larsen-Freeman 1983:166). Thus, the students tend to misunderstand that these two questions are just the statements of the teachers, if the students do not receive much input of these question types. The more opportunities the students have to answer tag and indirect questions, the more accustomed they will be to these question types. One might therefore reasonably support teacher strategies which emphasize a wide rage of question types, including tag and indirect questions.

Within one turn, the substitutions of a Yes/No question for a Wh- (special) question were more typical questioning behaviors than were those of a Wh-question for a Yes/No question (Hypothesis 7), although statistical significance was not found in the NS teachers' corpus. (However, it was obtained at $p<.25$, so that there may be a trend in that direction.) This tendency supports Palmer's pedagogical suggestion that "should the students hesitate at a question of the Special type, the teacher may replace it by a question of one of the other types" (Palmer 1921:66), and implies that the teachers assume that the change of a question type into a Yes/No question may lead to more comprehension and production. The students need some time in trying to start their answers. But both NS and NNS teachers' behaviors showed that there were no relatively long pauses' for the students' responses. Before a teacher gave students time enough to process the question, he or she was apt to change the question type very quickly, which might be problematic. Since Wh-questions will elicit longer and more syntactically complex utterances, as was seen in Tables 8 and 9, the high frequency of a Wh-question without changing it to a Yes/No question will be recommended, except when the students do not comprehend the question or answer it.

With respect to research question No.2, which addresses the relationship between teachers' question types and students' responses, two hypotheses were supported out of four hypotheses. The most important finding is that the use of Wh-questions has

the strongest positive relationship with learner outcomes (Hypotheses 10 and 11). The results indicated that Wh-question types elicited significantly longer and more syntactically complex responses than Yes/No question types, in both the ESL and EFL corpora. This suggests that in a classroom, teachers should pay attention to the distributions of Yes/No questions and Wh-questions, keeping in mind that the latter will trigger longer and more syntactically complex utterances produced by the students.

However, the hypotheses about the relationships between higher cognitive questions and the length and syntactic complexity of students' production were not confirmed in either of the ESL and EFL corpora (Hypotheses 12 and 13). Only in the ESL students' corpus did higher cognitive questions elicit significantly longer and more syntactically complex utterances. One reason that no relationship was found in the EFL students' corpus might be that they were not at a sufficiently high level of English proficiency. This may be support for Redfield and Rousseau (1981) and Klinzing and Klinzing-Eurich (1988), who argue that the use of higher cognitive questions affects students' achievement, especially with students of average and higher ability. But the effects of levels of cognitive questions on students' achievement remains at issue. In educational research, Redfield and Rousseau (1981:237) found that "gains in achievement can be expected when higher cognitive questions assume a predominant role during classroom instruction." But

Dillon (1982:549, as cited in Klinzing and Klinzing-Eurich 1988:217) suggests that, given the mixed previous findings about the relationship:

> a common educational presumption "ask a higher-level question, get a higher-level answer" may be replaced by "ask a high-level question, get any-level answer."

At any rate, Gage and Berliner (1984:636, also quoted in Klinzing and Klinzing-Eurich 1988:218) state that:

> ...asking higher level questions "works" in the sense of making students behave at relatively higher levels of cognitive processing.

It is for this reason that the use of higher cognitive questions is strongly recommended. The discussion above is based on the assumption that the students' production is necessary for language acquisition (see Seliger 1977, 1983). Swain (1985) proposes the "comprehensible output hypothesis," which suggests that the learners should produce output in the target language which is comprehensible to the interlocutors, in order to facilitate second language acquisition (SLA). Output as well as input is here considered to be a crucial variable in SLA.

Regarding research question No.3, which deals with the linguistic characteristics of ESL and EFL students' production, all two hypotheses were supported. The following interpretations come from the results of Hypotheses 14 and 15. Obviously, long c-units per turn mean that the students produce long utterances. In this sense, the EFL (Japanese) students did not take opportunities for production very effectively; therefore they will have to be trained to produce longer c-units per turn, being

reminded of the importance of active verbal participation. In addition, more questions to teachers and to students will lead to active classroom language performance and two-way communication. In the EFL students' corpus, all the questions to the students were cast only in "speeches" which two students delivered as warm-up activities at the beginning of one EFL class: in the ESL students' corpus, out of 13 student-to-student questions, 9 questions were posed in class discussions of one ESL class, the topic of which was not relevant to main activities of that lesson. Therefore in the main lesson activities, there were no student-to-student questions in the EFL classes and only 4 in the ESL classes. It is recommended that student-to-student questions and student-to-teacher questions be encouraged, in order to increase active and meaningful interaction in the classroom.

VII. Conclusion

Out of a total of fifteen hypotheses, nine hypotheses were statistically confirmed by the results. In summarizing the findings in this research, I find the following important implications for language teaching:

(1) The power of Wh-questions is very strong, since they will trigger longer and more syntactically complex utterances than Yes/No questions. It seems justifiable that teachers be careful about the frequencies of Yes/No questions and Wh-questions. We should not ignore the fact that Yes/No questions are easier to answer, so that adequate frequency of Yes/No questions is indispensable, presumably at a beginning level of language instruction. Moreover, teachers may try to have a wide range of syntactic question types, including more tag and indirect questions.

(2) It is important for teachers to notice that higher cognitive questions might increase the amount and syntactic complexity of student talk. This is not to say that lower cognitive questions should not be employed.

(3) NNS teachers may paraphrase questions in more cases, but not simply repeat them within one turn, when students have difficulties answering them. Only when there is no response to a Wh-question type, may it be desirable that teachers change it to a Yes/No question or an Or question, or wait for an answer.

(4) Especially in EFL contexts like those in Japan, teachers are advised to frequently give their students speaking turns and as

much talking time as possible, during which c-units per turn should increase.

(5) Just like natural discourse outside classrooms, two-way or multi-way exchange of information within the classroom is ideal for genuine communication, including interactions between/among students and initiation of interaction by a student to either a teacher or to classmates.

Now, I will point out several limitations of this study. First, there were four teachers as subjects: only two for each group. Hence, I have to admit that, given the small number of teachers, it is premature to draw conclusions from this study. It should only be viewed as an initial study.

Second, I could not test for interrater reliability on each measure.

Lastly, I could not control the levels of language instruction of the classes. One ESL class was at an advanced level, while the other ESL class and two EFL classes were at intermediate levels.

I will here make suggestions for further research on this topic.

First, I would attempt to examine the interactional features of the teachers' questions such as "confirmation checks, comprehension checks, clarification requests, self-repetitions, other-repetitions, expansions, and conversational frames" (Long 1983), because these conversational adjustments are considered

important and necessary to aid learners' comprehension and negotiate for meaning.

Second, the characteristics of the "follow-up" questions across turns should be investigated besides the questions within one turn, which were examined in this study. Which question will have an effect on students' answering, an initial question or a question following it, will also be an interesting issue in terms of primacy/recency effect.

Third, it would be better to look at the relationship between the syntactic question types and the cognitive question types, making grids (see Fanselow 1987:111). For example, I have to see how many higher cognitive questions are included in Wh-questions.

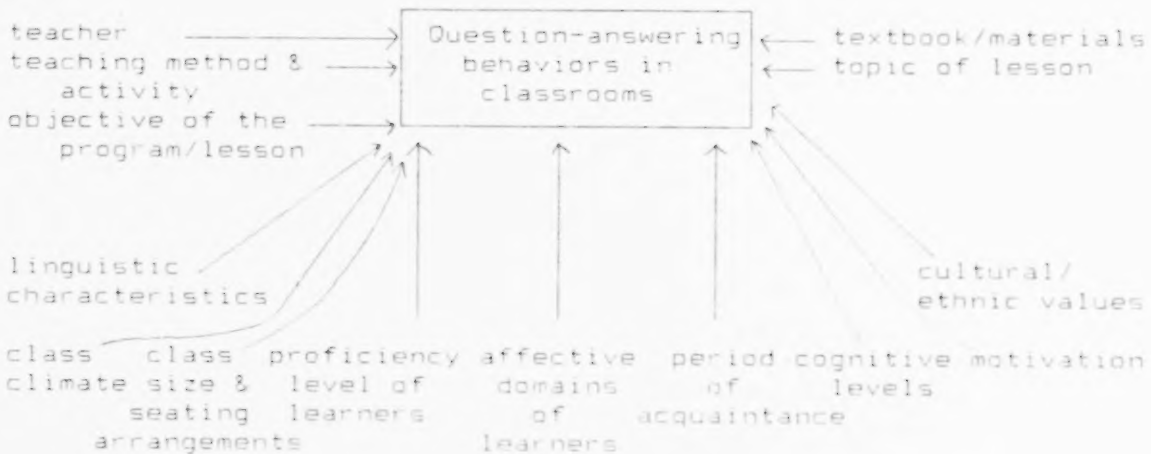
Fourth, I would take into consideration the relationship of teachers' longer questions with students' longer responses and the relationship between the length of utterances and syntactic complexity both in teachers' questions and in students' answers. In addition, the relationship between cognitive levels of teachers' questions and students' answers are in need of further investigation.

Lastly, future research would examine the differences of each Wh-question word (what, where, when, who, why, and how), which may generate variable lengths of utterances and syntactic complexity in students' responses (see Sigel and Kelly 1988:111).

Question-answering behaviors involve numerous variables, as shown in Figure 3.

FIGURE 3

Variables Affecting Question-Answering Behaviors



Here, I will explain only affective domains of learners towards questions, which should be investigated in more detail. Irrespective of the question types from syntactic and cognitive perspectives, affective domains do play an important role in question-answering exchanges. For example, suppose that a teacher asks a student, "Did you win the tennis match last Sunday?" Reaction will depend on the context: if he won the match, he should be glad to answer this question and this might lead to a longer response. On the other hand, if he lost it, the nature of the response may depend on his feelings: for instance, if he wanted to explain the reason for his loss, he might talk quite a

lot. A question like "Why were you absent yesterday?" may either increase or decrease the student's willingness to answer, depending in part on the teacher's tone of voice. If a teacher asks it in an angry tone, it might lead to shorter responses or even non-responses (see Sigel and Kelly 1988:113).

Question-answering behaviors must be examined from linguistic, psychological, and sociolinguistic perspectives comprehensively in order to make our language teaching more effective and dynamic and to contribute to classroom language acquisition of learners as well as curriculum and materials development and teacher education.

Notes

1. I would like to thank the following professors for their insightful and helpful comments on earlier versions of this paper: Kathleen M. Bailey (Monterey Institute of International Studies), Frederick J. Bosco, and Richard Lutz, the mentor. I am also grateful to the teachers and their students who served as subjects of this research. Any errors or deficiencies are of course my own.

2. Corder (1981:149) argues that those who are in the process of language acquisition cannot simplify their speech. His assumption implies that NNS teachers cannot do so. However, Gaies (1977) and Ishiguro (1986) found that NNS teachers as well as NS teachers did simplify teacher talk, especially in the length of utterances. Be that it may be, as Ishiguro (1988:39) states, "it may be true that NNS teachers have greater difficulties in adjustment and simplification of teacher talk than do NS teachers."

3. In Hypotheses 10 and 11, the relationship between Or (alternative) questions posed by teachers and students' responses are not taken into account, since "the length of choices governs the length of the responses, rather than the question type....[W]hen responding to either/or questions, we tend to restate one of the choices given" (Fanselow 1987:86).

4. It is possible that the gender of the teachers studied may have introduced an uncontrolled variable. Through my class observations and data analyses, however, I found no crucial difference in the gender variable.

5. The ESL class data included three Japanese students, which accounted for only 13 % of the total number of the ESL students. This was not considered to influence the comparison between the ESL and EFL class data, through my class observations and data analyses, because the Japanese ESL students rarely took speaking turns.

6. In this data collection, I must note that there exists a possible problem - different methods of collection: VCRs vs. tape recorders. Video cameras may have intimidated the EFL students, even though they were set far behind the students. On the contrary, the tape recorders did not make the data collection obtrusive to the ESL students. As a check against this variable, it would be necessary in the future to analyze additional data gathered by either video channels in ESL classes or audio channels in EFL classes.

7. I define 'pauses' here as wait time - the time when a teacher waits for the students to respond to the questions, or the time until a teacher produces the next utterances with no students' responses, or the time until a teacher calls upon another student to answer the questions. Unfortunately, quantitative analyses of pauses are beyond the scope of this study.

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